Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte PAUL ALEXANDER GALLOWAY

Appeal No. 2002-2027
Application No. 09/209,304

ON BRIEF

Before HAIRSTON, JERRY SMITH, and BARRY, *Administrative Patent Judges*.
BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

A patent examiner rejected claims 1-13. The appellant appeals therefrom under 35 U.S.C. § 134(a). We affirm-in-part.

BACKGROUND

The invention at issue on appeal concerns calibrating the "force constant" of a voice coil motor ("VCM") of a disc drive. The disc drive includes a base, at least one disc rotatably attached to the base, and an actuator assembly movably attached to the base. At least one transducer is attached to one end of the actuator assembly. A voice coil, which forms part of the VCM, is attached to the other end of the actuator assembly.

Magnets, which form the other portion of the VCM, are attached to the base. A current driver delivers current to the voice coil to move the actuator assembly. The force constant is a multiplier applied to an amplifier so that the output current to the voice coil products a velocity output replicating the desired velocity output. (Spec. at 20.)

In the past, asserts the appellant, a force constant was calibrated during the deceleration phase of long seeks, e.g., "seeks of 1000 tracks or more." (*Id.* at 5.) If only short seeks were requested, he adds, the force calibration could drift out of the correct calibration, (Appeal Br. at 4), and "[s]eek errors could result." (*Id.*)

In contrast, the invention determines a force constant during the acceleration phase of the movement of an actuator assembly. A velocity error signal is produced by comparing the desired velocity of the actuator assembly to the measured velocity during a linear mode of the associated current driver. The error signal can be based on one point in time or over a period of time. (*Id.* at 20.) By calibrating the force constant based upon the acceleration phase, explains the appellant, the force constant can be recalibrated during short seeks, e.g., seeks of as little as 20 tracks, (Appeal Br. at 4), "to produce real time updates to correct the force constant before the changes in the parameters that effect the force constant cause the value to drift out of calibration." (Spec. at 14.)

A further understanding of the invention can be achieved by reading the following claim.

8. An information handling system comprising:

a base;

a disc rotatably attached to the base; and

an actuator assembly movably attached to the base the actuator assembly further comprising a voice coil attached to the actuator assembly;

at least one magnet attached to the base and positioned near the voice coil to form a voice coil motor;

means for determining the amount of current to apply to the voice coil based on a comparison between an actual velocity and a demand velocity.

Claim 8 stands rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,480,217 ("Robbins"). Claims 1-7 and 9-13 stand rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 4,697,127 ("Stich") in view of U.S. Patent No. 5,363,359 ("Lee").

OPINION

Our opinion addresses the following rejections:

- anticipation rejection of claim 8
- obviousness rejection of claims 1-7 and 9-13.

Anticipation Rejection of Claim 8

Rather than reiterate the positions of the examiner or the appellant *in toto*, we address the main point of contention therebetween. The examiner asserts, "Robbins et al discloses a voice coil motor driving means that based on a comparison between an actual (measured) velocity and a demand (command/target/requested) velocity (see col. 3, lines 21-41 of Robbins et al) for controlling the voice coil motor driving." (Examiner's Answer at 3.) The appellant argues, "[t]he Examiner has not shown how the applied references [sic] disclose equivalents of the structure described in the present application, namely means for limiting the amount of roll motion of the slider." (Appeal Br. at 6.)

"Analysis begins with a key legal question -- *what* is the invention *claimed*?" *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). "An element in a claim for a combination may be expressed as a means . . . for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112, ¶ 6 (2002). However, "limitations are not to be read into the claims. . . ." *In re Van Geuns*, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993) (citing *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)).

Here, we agree with the examiner that the function of "limiting the amount of roll motion of the slider is not claimed. Moreover, this limitation is not described in the instant specification." (Examiner's Answer at 6.) Instead, claim 8 specifies in pertinent part the following limitation: "means for determining the amount of current to apply to the voice coil based on a comparison between an actual velocity and a demand velocity." Construing the limitation to cover the corresponding structure shown in Figure 2 of the specification and equivalents thereof, the claim requires circuitry for comparing a desired velocity to a measured velocity.

"Having construed the claim limitations at issue, we now compare the claims to the prior art to determine if the prior art anticipates those claims." *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349, 64 USPQ2d 1202, 1206 (Fed. Cir. 2002). "[A]nticipation is a question of fact." *In re Hyatt*, 211 F.3d 1367, 1371, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (citing *Bischoff v. Wethered*, 76 U.S. (9 Wall.) 812, 814-15 (1869); *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). "A claim is anticipated . . . if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (citing *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 715, 223 USPQ 1264, 1270 (Fed. Cir. 1984); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548,

220 USPQ 193, 198 (Fed. Cir. 1983); *Kalman v. Kimberly-Clark Corp.*, 713 F.2d760, 771, 218 USPQ 781, 789 (Fed. Cir. 1983)).

Here, we find that Robbins discloses circuitry for comparing a desired velocity to a measured velocity. Generally, Figure 2 of the reference shows a servo system wherein a "requested velocity command," col. 3, l. 30, "is compared to the measured velocity at a summation node 21." *Id.* at ll. 32-33. More specifically, "[a] velocity error signal is produced at the node 21 which is proportional to the difference between the requested velocity and the measured velocity, i.e., the two voltages may be compared by a difference amplifier circuit." *Id.* at ll. 31-37. Therefore, we affirm the anticipation rejection of claim 8.

Obviousness Rejection of Claims 1-7 and 9-13

The examiner asserts, "Stich et al discloses a current driver (47) for the actuator (21) which the driving current is based on the force constant (factor) (see col. 6, lines 10-14 and col. 10, line 48 to col. 11, line 49 of Stich et al)." (Examiner's Answer at 4.) The appellant argues, "[a]lthough the Stich et al. reference mentions a force constant, the Stich et al reference fails to determine a force constant error signal based on the velocity error, or one based on the acceleration portion of the velocity profile. . . ." (Appeal Br. at 10.)

"[T]he Board must give claims their broadest reasonable construction. . . ." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1668 (Fed. Cir. 2000). Here, independent claim 1 specifies in pertinent part the following limitations: "determining a force constant error based on the comparison between the velocity error over the selected portion of acceleration time and a reference value." Similarly, independent claim 9 specifies in pertinent part the following limitations: "a current driver for the voice coil which determines an actual velocity of the actuator and transducer, wherein an amount of current delivered to the voice coil is determined, in part, by a force constant error determined by a difference between the actual velocity and a demand velocity during an acceleration phase of a movement of the actuator and transducer." Giving the independent claims their broadest, reasonable construction, the limitations require determining a force constant error based on the difference between between a desired velocity and a measured velocity during the acceleration of a disc drive's actuator.

Having determined what subject matter is being claimed, the next inquiry is whether the subject matter would have been obvious. "In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness." *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993)(citing *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444

(Fed. Cir. 1992)). "'A *prima facie* case of obviousness is established when the teachings from the prior art itself would . . . have suggested the claimed subject matter to a person of ordinary skill in the art.'" *In re Bell*, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

Here, as aforementioned, the examiner reads the claimed force constant on what he terms a "force constant (factor)" allegedly taught by Stich. He cites two passages of the reference to support his position. The first passage, viz., col. 6, ll. 10-14, includes no such terminology. The second passage does mention that an "actuator carriage 21 and transducer suspension 34 . . . have a mechanical force constant Kf," col. 10, ll. 50-52, and that a "velocity estimator 56, know[s] the actuator/driver parameters, that is actuator force constant (Kf). . . ." Col. 11, 38-39. The examiner fails to show, however, that the reference's force constant, Kf, is determined based on the difference between a desired velocity and a measured velocity during the acceleration of its actuator. Relying on Lee "for the teaching of the actual velocity error for substituting the estimated velocity error in Stich et al so an accurate velocity error to be achieved," (Examiner's Answer at 8), the examiner fails to show that the addition of Lee

cures the aforementioned deficiency of Stich.[1] Absent a teaching or suggestion of determining a force constant error based on the difference between a desired velocity and a measured velocity during the acceleration of a disc drive's actuator, the examiner fails to present a *prima facie* case of obviousness. Therefore, we reverse the obviousness rejection of claims 1-7 and 9-13.

CONCLUSION

In summary, the rejection of claim 8 under § 102(b) is affirmed. In contrast, the rejection of claims 1-7 and 9-13 under § 103(a) is reversed. "Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences. . . ." 37 C.F.R. § 1.192(a)(2002). Accordingly, our affirmance is based only on the arguments made in the brief. Any arguments or authorities not included therein are neither before us nor at issue but are considered waived. No time for taking any action connected with this appeal may be extended under 37 C.F.R. § 1.136(a).

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[1] Responding to the appellant's arguments, the examiner mentions, "[t]he velocity error of Lee is in accordance with the definition of the force constant error on page 6, lines 21-23 of the specification." (Examiner's Answer at 8.) Being basically a board of review, we leave it to the examiner to decide whether to make an anticipation rejection based on the reference.

AFFIRMED-IN-PART

KENNETH W. HAIRSTON Administrative Patent Judge	)
JERRY SMITH Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
LANCE LEONARD BARRY Administrative Patent Judge	)

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